

38. The method according to claim 37 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

Copies of specification pages 26-27, amended in accordance with the claim amendments described above, are enclosed will be provided.

REMARKS:

As the examiner can see, the claims have been amended to state the essential elements of applicants' invention. Support for the claim amendments may be found on, for example, page 7 of the application as filed.

Claims 28-34 were rejected under 35 USC 112. Applicants believe that the amendments to claim 28 overcome this objection.

Claim 28 was rejected under 35 USC 102 as anticipated by Jacobsen-Lyon et al. Applicant notes that the cited reference found expression of nonsymbiotic hemoglobin in some plant tissues. However, this reference does not teach improving agronomic properties of a plant by providing the plant increased levels of nonsymbiotic hemoglobin. Rather, this reference analyzed the promoter of a nonsymbiotic hemoglobin gene using reporter gene constructs. Furthermore, applicants note that on page 219, first paragraph, last 3 lines, Jacobsen-Lyon states "until we have mutant plants available, we will not be certain of the function of plant hemoglobins in non-symbiotic tissues". Thus, Jacobsen-Lyon does not teach that there would be any benefit to increasing levels of non-symbiotic hemoglobin in a plant cell. Applicants b li v that in view

of the above arguments and the amendments to claim 28, this rejection is overcome.

Claims 28-38 were rejected under 35 USC 103(a) in view of Bailey and Sowa. Applicant notes that as stated in the information disclosure statement filed January, 2002, the Sowa reference appeared in the August 1998 issue of Proceedings of the National Academy of Sciences USA and is therefore not prior art, as the provisional application on which the instant application claims priority on (60/090,929) was filed on June 26, 1998, prior to the publication of this reference.

The examiner's assistance and helpfulness in this matter has been greatly appreciated. Further and more favorable consideration of the application in view of the amendments is respectfully requested.

Respectfully submitted  
Philip Guy et al.

PER: Michael Williams  
**MICHAEL WILLIAMS**  
Registration No: 45,333

MRW/dj  
Enc. (2)

Michael R. Williams

Winnipeg, Manitoba, Canada  
Telephone (204) 947-1429  
FAX (204) 957-0516

**CERTIFICATION OF FACSIMILE TRANSMISSION**

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DORIS JONES

D Jones

**DATE: May 7, 2002**

CLAIMS

28. A method of improving the agronomic properties of a plant comprising:

5 maintaining plant vigor and hardiness under stressful conditions by providing [a] the plant [having] with increased cellular levels of a nonsymbiotic plant hemoglobin; and

growing the plant under stressful conditions, thereby allowing the plant to develop more vigorously under adverse conditions.

29. The method according to claim 28 wherein the nonsymbiotic 10 plant hemoglobin is barley nonsymbiotic hemoglobin.

30. The method according to claim 28 wherein the improved agronomic properties include germination.

31. The method according to claim 28 wherein the improved agronomic properties include seedling vigour.

15 32. The method according to claim 28 wherein the improved agronomic properties include reduced cellular levels of fermentation products.

33. The method according to claim 28 wherein the improved agronomic properties include increased oxygen uptake.

20 34. The method according to claim 28 wherein the improved agronomic properties include increased tolerance to hypoxic conditions.

35. A method of selecting seeds for breeding to produce seed lines having desirable characteristics comprising:

providing a representative seed of a given seed line;

growing the seed such that the seed germinates;

25 isolating an extract from the seed;

measuring levels of nonsymbiotic plant hemoglobin expression within the extract; and

selecting or rejecting the seed for further breeding based on the hemoglobin levels.

30 36. The method according to claim 35 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

37. A method of determining if a seed is germinating comprising:

- 27 -

providing a seed suspected of germinating;  
isolating an extract from the seed; and  
measuring levels of nonsymbiotic plant hemoglobin expression  
within the extract,

5 wherein high levels of nonsymbiotic plant hemoglobin expression  
indicate that the seed is germinating.

38. The method according to claim 37 wherein the nonsymbiotic  
plant hemoglobin is barley nonsymbiotic hemoglobin.

CLAIMS

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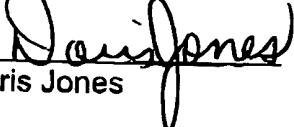
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I hereby certify that this paper is being facsimile transmitted to the Patent And Trademark Office on the date shown below. The document consists of 2 pages of replacement claims and 2 pages showing the claim amendments and are in addition to the response filed.

DORIS JONES

  
Doris Jones

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